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# The Relationship between Geographic Diversification and Bank Lending

Morteza Kaviani<sup>1\*</sup>, Masumeh Jafari<sup>2</sup>, Kaveh Kaviani<sup>2</sup>

<sup>1</sup> Department of Accounting, Shafagh Institute of Higher Education, Tonekabon, Iran; morteza.kaviani41@yahoo.com.

<sup>2</sup> Department of Financial Management, Karaj Branch, Islamic Azad University, Karaj, Iran; m.jafari8269@gmail.com; kaveh.k79@gmail.com.

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## Abstract


Investigating the relationship between geographic diversity and bank lending is a question that banks always face and is one of the essential daily issues they must answer. Therefore, this study aims to investigate the relationship between geographic diversity and bank lending. This research was conducted from 2012 to 2019 on 15 sample banks listed in the Tehran Stock Exchange, which were selected using a systematic method. This study estimates the model using the panel data method. The results indicate a relationship between geographical diversity and bank lending, and there is no relationship between geographical diversity and bank lending despite the currency crisis.


**Keywords:** Geographic diversification, Bank lending, Currency crisis.

## 1 | Introduction

Banks are one of the service institutions that deal with the vital pulse of society, namely the economy, and most people in society are directly or indirectly related to banking services. Banks can provide economic development and growth or economic stagnation and stagnation with credit decisions and policies [1]. In the last few decades, the financial industry, especially the banking industry, has experienced growth that has led to its transformation into a global industry, which has contributed to the very rapid development of the banking industry in the face of the global financial crisis of 2007-2009 and the increase in uncertainty along with further globalization.

Global Islamic banking assets grew from \$1.3 trillion in 2012 to \$1.76 trillion in 2018 and are expected to reach \$2.175 trillion by 2024 (Islamic finance development report, 2020). The driving forces of this transformation have been technological innovation, structural deregulation, prudential regulation, internationalization, and changes in the behavior of large firms [2]. One of the results of these developments

 Corresponding Author: mmorteza.kaviani41@yahoo.com

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is the implementation of diversification policies in banks, which is of great importance to bank managers, shareholders, and financial economists [3]. Diversification is one of the essential topics in financial literature. Banks can use diversification strategies to improve performance and reduce risk [4]. One of the outcomes of these developments is the implementation of diversity policies in banking, which is of great importance to bank managers, shareholders, and financial economists [3].

Therefore, diversification is one of the essential topics in the financial literature, and banks can use diversification strategies to improve performance and reduce risk [4]. The Oxford Dictionary (2009) defines the term diversification as follows: (in the case of companies) means expanding or changing the range of products, activities, or the like to reduce the company's dependence on a particular market, etc. The concept of diversification depends on the subjective interpretation of a new market or product, which should reflect the perception of customers rather than the managers of that market or product. Products create or stimulate new markets, and new markets promote product innovation [5]. Diversity in manufacturing firms refers to the diversity of products produced, while in financial firms, including banks, diversity refers to the diversity of income [6], [7] and diversity of assets. In other words, three types of diversification, namely geographic, asset, and activity diversification, are examined in empirical bank studies [8], where geographic diversification refers to the development of a geographic area and is based on bank deposits and assets.

Asset diversity refers to the different types of assets on an institution's balance sheet, both within major asset classes (i.e., cash, securities, and loans) and within these groups (i.e., types of loans), and activity or revenue diversity refers to the kinds of revenue sources. Regarding geographical diversification, the Company has different branches and operates in other cities and countries. Instead, each geographical segment is a distinguishable component of the Company that provides products or services in a particular geographical area, including one or more other geographical regions, and is subject to risks and returns that are different from those of components operating in other geographical areas.

The following factors should be considered when identifying geographical segments: a) Similarity of economic and political conditions, b) Relationships between operations in different geographical regions, c) Proximity of operations, d) Specific risks arising from operations in particular areas, and e) Exchange control regulations and the risk of currency fluctuations. Geographic diversification is typically associated with risk reduction, although there is much debate about the magnitude of the risk reduction benefits. Modern portfolio theory suggests that asset diversification reduces return volatility and is likely to increase capital gains [9]. In addition, geographic diversification allows small banks to protect themselves against market and specific (unsystematic) risk, as banks are susceptible to local economic changes and individual loan defaults [10].

On the one hand, the role of financial institutions can be explained through the balance sheet channel (or broad credit channel) and the bank lending channel (or narrow credit channel). The bank lending channel assumes that bank loans are the main source of financing for small and medium-sized enterprises, while large firms have direct access to financial markets through the issuance of stocks and bonds. Suppose the financial needs of small and medium enterprises exceed their internal resources. In that case, they will turn to bank resources, but their access to bank resources (bank loans) directly depends on the price and amount of available credit and the credit supply policy. Credit plays an important role in the transmission and linkage between the monetary and financial sectors and the real sector of the economy. The monetary policy effectiveness through the bank credit channel mechanism is such that the implementation of contractionary monetary policy causes a decrease in bank deposits and, as a result, bank credit decreases. Therefore, this study seeks to answer the question: Is there a relationship between geographic diversity and bank lending?

## 2 | Research Hypotheses

In the light of the material presented, the following questions are raised in the present study:

- I. There is a relationship between geographic diversification and bank lending.
- II. There is a relationship between geographic diversification and bank lending despite the currency crisis.

### 3 | Methodology

Because this study's results can be useful to a wide range of users, it is practical to use based on its purpose. Scientific research can also be divided into five groups based on its nature and method: historical, descriptive, correlational, causal, and experimental. Correlational research is conducted to obtain information about a relationship between variables; therefore, the present study is correlational and analytical.

#### 3.1 | Statistical Population and Sample

This study's statistical population includes banks listed on the Tehran Stock Exchange. The study's time frame is 9 years, from the beginning of 2012 to the end of 2019. Also, considering the conditions and limitations, 15 banks were selected from among the banks listed on the Tehran Stock Exchange.

##### Statistical sampling method and sample size

Taking into account the following conditions, a limited and targeted research population is obtained among the banks listed in the Tehran Stock Exchange, and this population is used as a sample.

- I. The banks in question must be members of the Tehran Stock Exchange from the beginning of 2012 to the end of 2019.
- II. To ensure comparability, they must have the same fiscal year ending in Esfand (12/29).
- III. Banks have not changed their financial period during the period under review (1391-1399).
- IV. Banks have not changed their type of activity during the period under review (1391-1399).
- V. Their data are available.

Due to the restrictions imposed, 15 banks from the Tehran Stock Exchange were studied as a sample.

#### 3.2 | Variables and Research Model

In this study, the following regression model from the research of Doerr and Schaz [10] was used for hypothesis testing:

$$\text{LOAN}_{it} = \beta_0 + \beta_1 \text{DIV}_{it} + \beta_2 \text{BC}_{it} + \beta_3 \text{DIV}_{it} * \text{BC}_{it} + \beta_4 \log(\text{assets})_{it} + \beta_5 \text{ROE}_{it} + \beta_6 \text{LEV}_{it} + \beta_7 \text{ROA}_{it} + \varepsilon_{it}.$$

##### Dependent variable

LOAN: logarithm of bank loans.

##### Independent variable

DIV: the independent variable representing geographical diversity is the number of cities in which bank *i* was active in year *t* (excluding cities where it has its headquarters).

##### Modifier variable

BC: currency crisis: years with a monetary crisis are number one; otherwise, zero. (Years 2011, 2016, 2018, 2019).

Log (assets): logarithm of total assets.

Return on equity: return on equity.

LEV: financial leverage, the ratio of debt to total assets.

ROA: return on assets, the net income ratio to total assets.

## 4 | Findings

### 4.1 | Descriptive Statistics

This section first discusses and examines the descriptive statistical indicators of the research variables, the results of which are presented in *Table 1*.

**Table 1. Descriptive statistics of variables.**

Variable	Symbol	Average	Median	Max	Min	SD.
Logarithm of bank loans	LOAN	8.321	8.33	9.72	6.44	0.56
Geographic variety	DIV	2.49	2.39	3.36	1.74	0.47
Currency Crisis	BC	0.333	0.00000	1	0.00000	0.47
Logarithm of total assets	LOGASSETS	19.75	19.71	22.74	16.0252	1.23
Return on equity	ROE	0.16	0.16	3.2	-4.19	0.571
Financial leverage	LEV	0.98	0.94	3.31	0.515	0.29
Return on assets	ROA	-0.007	0.007	0.076	-0.538	0.077

The mean is the most basic and widely used measure of central tendency. It is right at the equilibrium point and center of gravity of the data. Variables are of good quality if there is little difference between their mean and median.

### Testing hypotheses

One of the important assumptions in regression is that the variance of the error terms is equal. Given the important effect of variance heterogeneity on the estimation of the coefficients' standard deviation and statistical inference, it is necessary to examine the presence or absence of variance heterogeneity before making any estimates. The results are shown in *Table 2*:

**Table 2. Test for heteroscedasticity of variance.**

	Test	t-Stat.	Prob.
Model	Breach-pagan LM	273.41	0.000
	Persian- scaled LM	11.62	0.000

Examination of the values of the Chi-square statistic of the tests performed shows that the null hypothesis of equality of variance is not confirmed; therefore, the model has a problem of variance heterogeneity. Thus, the GLS test is used to estimate the model.

$$\text{LOAN}_{it} = \beta_0 + \beta_1 \text{DIV}_{it} + \beta_2 \text{BC}_{it} + \beta_3 \text{DIV}_{it} * \text{BC}_{it} + \beta_4 \log(\text{assets})_{it} + \beta_5 \text{ROE}_{it} + \beta_6 \text{LEV}_{it} + \beta_7 \text{ROA}_{it} + \varepsilon_{it}.$$

**Table 3. Model test result.**

Variable Name	Coeff.	t-Stat.	Sig.
C	2.827	3.128	0.0024
DIV	2.331	6.265	0.0000
BC	0.021	0.129	0.8975
DIV*BC	0.007	0.115	0.9083
LOGASSETS	0.21	3.162	0.0022
ROE	0.06	1.82	0.0723
LEV	-0.264	-1.732	0.087
ROA	-0.162	-0.29	0.7724
R <sup>2</sup>	0.901	F-statistic	36.36
Adjusted R <sup>2</sup>	0.877	P-value	0.0000
		Durbin-watson test	1.73

According to *Table 3*, the significance level between the two variables is 0.000, which is lower than the significance level considered in this study (5%). Also, the absolute value of the t-statistic, 6.265, is more significant than 1.96, which corresponds to a standard normal distribution of 0.95; therefore, at the 95% confidence level, the null hypothesis that there is no relationship between geographic diversity and bank lending is not rejected, and the main hypothesis is confirmed.

According to *Table 3*, the significance level between the two variables is 0.9083, which is higher than the significance level considered in this study (5%). Also, the absolute value of the t-statistic, which is 0.115, is less than 1.96, which corresponds to a standard normal distribution of 0.95; therefore, at the 95% confidence level, the null hypothesis that there is no relationship between geographic diversity and bank lending despite the currency crisis is confirmed and the main hypothesis is not confirmed. A summary of the results is presented in *Table 4*.

**Table 4. Summary of research findings.**

Hypothesis	Title of Research Hypotheses	Relationship Type	Results
First	There is a relationship between geographic diversification and bank lending.	Positive	Confirmation
Second	Despite the currency crisis, there is a relationship between geographic diversification and bank lending.	Negative	Disapproval

## 5 | Conclusion

Discussion and conclusion the first hypothesis, There is a relationship between geographic diversity and bank lending, was tested. The results of the research's first hypothesis show a positive and significant relationship between geographical diversity and bank lending. The test results of the first main hypothesis are explained as follows: diversified banks in centralized banking systems have better profit opportunities, probably due to market power, economies of scale, and synergy among other firms. Therefore, diversified banks may be less vulnerable than specialized banks if they operate in a concentrated market. If diversification affects competition in banking markets, banks' risk may also change, and competition for borrowers may increase sharply as banks expand their loan portfolios. The results of the first hypothesis test are consistent with and supported by the research of Doerr and Schaz [11].

The results of the second hypothesis show no relationship between geographical diversity and bank lending despite the currency crisis. The results of the test of the second main hypothesis are explained so that it can also be related to the conventional mechanism of the country's banking system in granting facilities. The origin of most bank facilities is associated with the legal requirements and regulatory structure of lending in Iran. Considering the issue above, economic instability and currency crisis cannot significantly affect the amount of bank lending. Upon further consideration, the results show that the research findings are consistent with and supported by the research findings of Rezaei and Norouzi [12] and Doerr and Schaz [11] and Kaviani et al. [13].

### Research limitations

One limitation of this research was the method of extracting banking data. Due to a change in the format of the report provided by the Higher Banking Education Institute, it was not possible to calculate some of the data accurately in the years in question. The political and economic conditions of the country, as well as the prevailing psychological atmosphere in the Tehran Stock Exchange market, can affect the variables of this study. Still, they were not controlled in the present study. This research is affected by macro factors such as inflation rate, interest rate on received facilities, and exchange rate, which are assumed to have the same effect for all companies and observations. At the same time, this may not be the case. Therefore, such factors may affect the results of this study.

## Suggestions

- I. It is recommended that senior bank managers review this study's results to understand better potential opportunities and strategies for improving bank financial stability.
- II. Bank managers are suggested to reduce their concentration through branches that do not have desirable expected profits, achieving greater financial stability while reforming their market structure.
- III. It is recommended that central bank policymakers and legislators review the mix of facilities offered by banks in the country and model them on the results of research and the experiences of other countries. This would increase financial stability and reduce bank financial crises.

## Based on the results of this research, it is proposed to examine

- I. Analyzing the effect of geographic diversification on bank stock returns
- II. Other diversification criteria, including income and service diversification, should be considered in bank lending.

## Conflict of Interest

The authors declare no conflict of interest.

## Data Availability

All data are included in the text.

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## References

- [1] Zangibadi, AliHosseini, R. A. (2012). The evolution of banking since its inception. *Bank and economy*, (110), 17–27. **(In Persian)**. <https://www.magiran.com/p803926>
- [2] Melina, Sukono, Napitupulu, H., & Mohamed, N. (2023). A conceptual model of investment-risk prediction in the stock market using extreme value theory with machine learning: A semisystematic literature review. *Risks*, 11(3), 60. DOI:10.3390/risks11030060
- [3] Sawada, M. (2013). How does the stock market value bank diversification? Empirical evidence from Japanese banks. *Pacific-basin finance journal*, 25, 40–61. DOI:10.1016/j.pacfin.2013.08.001
- [4] Turkmen, S. Y., & Yigit, I. (2012). Diversification in banking and its effect on banks' performance: Evidence from Turkey. *American international journal of contemporary research*, 2(12), 111–119.
- [5] Dadbeh, F., & Bagherabadi, S. M. (2012). *Corporate diversification and financial reporting with accounting features*. **(In Persian)**. <https://www.accpres.com/news/1391/09/>
- [6] Ebrahimi, S. K., Shahriyari, M., & Mehman Navazan, S. (2016). Assay the effect of revenue diversification on performance in accepted banks in the Tehran Stock Exchange. *Financial knowledge of security analysis (financial studies)*, 9(30), 67–75. **(In Persian)**. <https://sid.ir/Paper/200211/En>
- [7] Shahchera, M., & Jozdani, N. (2016). Diversification of incomes and profitability in the country's banking network. *Journal of financial and economic policies*, 4(14), 33–52. **(In Persian)**. [https://elmnet.ir/doc/1551606-81142?elm\\_num=1](https://elmnet.ir/doc/1551606-81142?elm_num=1)
- [8] Deng, S., Elyasiani, E., & Mao, C. X. (2007). Diversification and the cost of debt of bank holding companies. *Journal of banking & finance*, 31(8), 2453–2473. DOI:10.1016/j.jbankfin.2006.10.024
- [9] Hayden, E., Porath, D., & Westernhagen, N. v. (2007). Does diversification improve the performance of german banks? Evidence from individual bank loan portfolios. *Journal of financial services research*, 32(3), 123–140. DOI:10.1007/s10693-007-0017-0

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- [10] Emmons, W. R., Gilbert, R. A., & Yeager, T. J. (2004). Reducing the risk at small community banks: is it size or geographic diversification that matters? *Journal of financial services research*, 25(2), 259–281. DOI:10.1023/B:FINA.0000020665.54596.f6
- [11] Doerr, S., & Schaz, P. (2021). Geographic diversification and bank lending during crises. *Journal of financial economics*, 140(3), 768–788. DOI:10.1016/j.jfineco.2021.02.004
- [12] Rezaei, N., & Norouzi, A. (2019). Economic policy uncertainty, banks' lending decisions. *Journal of investment knowledge*, 8(32), 315–330. **(In Persian)**. [http://www.jik-ifea.ir/article\\_15139\\_en.html?lang=en](http://www.jik-ifea.ir/article_15139_en.html?lang=en)
- [13] Kaviani, K., Kaviani, M., & Arfaie, M. (2023). Analysis of lending behavior of banks in Tehran capital market under non-performing loans. *Financial and banking strategic studies*, 1(2), 87-92. **(In Persian)**. DOI:10.22105/fbs.2023.179924